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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Teradata Docket No. 9684

Application of:

BISGAARD-BOHR, M. et al.   Group Art Unit: 2161

Serial No. 09/739,994   Examiner: NGUYEN, CINDY

Filed: December 18, 2000

For: DATA MODEL FOR ANALYSIS OF RETAIL TRANSACTIONS USING
        GAUSSIAN MIXTURE MODELS IN A DATA MINING SYSTEM

Commissioner for Patents
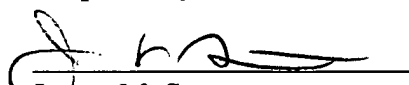P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF TRANSMITTAL LETTER

Sir:

Transmitted herewith for filing is an Appeal Brief to the Final Rejection dated

December 6, 2007.

☒ Please charge Deposit Account No. 50 4370 for the Appeal Brief fee or any other

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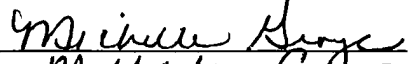
Account No. 50 4370.

Respectfully submitted,

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

Sir:

This is an Appeal Brief in furtherance of the Notice of Appeal filed on December 6, 2007 and Notice of Panel Decision from Pre-Appeal Brief Review dated February 13, 2008. In light of this Brief, Applicant asks the Board of Patent Appeals and Interferences to reconsider this application.

CERTIFICATION OF MAILING UNDER 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on _5/13-08_.

By: _Michelle George_
Name: _Michelle George_

(I) REAL PARTY IN INTEREST

The present application is assigned to Teradata US, Incorporated.

(II) RELATED APPEALS AND INTERFERENCES

There are currently no known active appeals or interferences related to the present application.

(III) STATUS OF CLAIMS

The above-identified patent application was filed on December 18, 2000 with original claims 1 through 24. Additional new claims 25-27 were added in a RCE and Amendment filed on July 20, 2005. Claims 1, 6-9, 14-17, and 22-27 remain active and stand rejected.

The rejections of claims 1, 6-9, 14-17, and 22-27 are being appealed.

Copies of the claims in their current form are provided in the Claims Appendix (section VIII) of this Appeal Brief.

(IV) STATUS OF AMENDMENTS

The U.S. Patent and Trademark Office issued a Final Office Action in the prosecution of the present application on September 7, 2007. In response to this Final Official Action, Applicant filed a Notice of Appeal and Pre-Appeal Brief Request for Review on December 6, 2007. A Notice of Panel Decision from Pre-Apeal Brief Review was issued by the U.S. Patent and Trademark Office on February 13, 2008. The Panel Decision instructed the Applicant to proceed to the Board of Patent Appeals and Interferences to continue prosecution of the present application.

(V) SUMMARY OF CLAIMED SUBJECT MATTER

<u>Claim 1</u>

Claim 1 recites a computer-implemented data mining system, comprising:

a relational database managed by a relational database management system for storing retail transactional data (*see, e.g.,* Application, pg. 3, lines 17-24, and pg. 4, lines 7-27; Figure 1, data servers 110A-110E, storage devices 112A-112E, and RDBMS 132);

a data model that defines the manner in which said retail transactional data is stored and organized within said relational database (*see, e.g.,* Application, pg. 7, line 21 through pg. 8, line 8; Figure 2), said data model comprising a basket database table that contains summary information about the retail transactional data (*see, e.g.,* Application, pg. 7, line 27 through pg. 8, line 3; Figure 2, basket table 202), an item database table that contains information about individual items referenced in the retail transactional data (*see, e.g.,* Application, pg. 7, line 27 through pg. 8, line 3; Figure 2, item table 204), and a department database table that contains aggregate information about the retail transactional data (*see, e.g.,* Application, pg. 7, line 27 through pg. 8, line 3; Figure 2, department table 206), and the data model is mapped to aggregate the transactional data for cluster analysis of shopping (*see, e.g.,* Application, pg. 8, lines 4-8); and

wherein the cluster analysis groups the retail transactional data into coherent groups according to perceived similarities in the retail transactional data (*see, e.g.,* Application, pg. 5, lines 8-11, and pg. 8, line 10 through pg. 9, line 21; Figue 3) and presents the results of said cluster analysis to a user (*see, e.g.,* Application, pg. 9, lines 7-12; Figue 3, block 310).

<u>Claim 9</u>

Claim 9 recites a method for analyzing retail transactional data in a computer-implemented data mining system, comprising:

maintaining a relational database managed by a relational database management system for storing retail transactional data (*see, e.g.,* Application, pg. 3, lines 17-24, and pg. 4, lines 7-27; Figure 1, data servers 110A-110E, storage devices 112A-112E, and RDBMS 132)

generating a data structure in the computer-implemented data mining system, wherein the data structure is a data model that defines the manner in which said retail transactional data is stored and organized within said relational database (*see, e.g.,* Application, pg. 7, line 21 through pg. 8, line 8; Figure 2), said data model comprising a basket database table that contains summary information about the retail transactional data (*see, e.g.,* Application, pg. 7, line 27 through pg. 8, line 3; Figure 2, basket table 202), an item database table that contains information about individual items referenced in the retail transactional data (*see, e.g.,* Application, pg. 7, line 27 through pg. 8, line 3; Figure 2, item table 204), and a department database table that contains aggregate information about the retail transactional data (*see, e.g.,* Application, pg. 7, line 27 through pg. 8, line 3; Figure 2, department table 206);

mapping the data model to aggregate the transactional data for cluster analysis of shopping behavior (*see, e.g.,* Application, pg. 8, lines 4-8; Figure 2);

performing cluster analysis to group said retail transactional data into coherent groups according to perceived similarities in the retail transactional data (*see, e.g.,* Application, pg. 5, lines 8-11, and pg. 8, line 10 through pg. 9, line 21; Figue 3); and

presenting the results of said cluster analysis to a user (*see, e.g.,* Application, pg. 9, lines 7-12; Figue 3, block 310).

Claim 17

Claim 17 recites an apparatus for analyzing retail transactional data in a
computer-implemented data mining system, comprising:

a relational database managed by a relational database management system
for storing retail transactional data (*see, e.g.,* Application, pg. 3, lines 17-24, and
pg. 4, lines 7-27; Figure 1, data servers 110A-110E, storage devices 112A-112E,
and RDBMS 132)

means for generating a data structure in the computer-implemented data
mining system, wherein the data structure is a data model that defines the manner
in which said retail transactional data is stored and organized within said relational
database (*see, e.g.,* Application, pg. 7, line 21 through pg. 8, line 8; Figure 2), said
data model comprising a basket database table that contains summary information
about the retail transactional data (*see, e.g.,* Application, pg. 7, line 27 through pg.
8, line 3; Figure 2, basket table 202), an item database table that contains
information about individual items referenced in the retail transactional data (*see,
e.g.,* Application, pg. 7, line 27 through pg. 8, line 3; Figure 2, item table 204), and
a department database table that contains aggregate information about the retail
transactional data (*see, e.g.,* Application, pg. 7, line 27 through pg. 8, line 3;
Figure 2, department table 206); and

means for mapping the data model to aggregate the transactional data for
cluster analysis of shopping behavior (*see, e.g.,* Application, pg. 8, lines 4-8;
Figure 2);

means for performing cluster analysis to group said retail transactional data
into coherent groups according to perceived similarities in the retail transactional
data (*see, e.g.,* Application, pg. 5, lines 8-11, and pg. 8, line 10 through pg. 9, line
21; Figue 3); and

means for presenting the results of said cluster analysis to a user (*see, e.g.,* Application, pg. 9, lines 7-12; Figue 3, block 310).

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Pursuant to the September 7, 2007 Final Office Action, claims 1, 6-9, 14-17 and 22-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,301,575 (hereafter Chadha et al.) in view of Bruce Moxon, "Data Mining: The Golden Promise," copyright 1997, Miller Freeman, Inc. (hereafter Bruce). Claims 25-27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chadha in view of Bruce, and further in view of U.S. Patent No. 6,263,337 (hereafter Fayyad et al.).

The rejections of claims 1, 6-9, 14-17 and 22-27 under 35 U.S.C. §103(a) are being appealed.

(VII) ARGUMENT

The rejection of claims 1, 6-9, 14-17 and 22-27 under 35 U.S.C. §103(a) are respectfully traversed. To establish a *prima facie* case of obviousness, at least the following requirements must be met: (1) the references when combined must teach or suggest all elements of the claimed subject matter; (2) there must be some motivation, suggestion or teaching to combine the references; and (3) there must be, within the references, a reasonable expectation of success. *See* M.P.E.P. § 2143 (8th ed., Rev. 2), at 2100-129. The Office has not established a *prima facie* case of obviousness because these requirements have not been satisfied. The references when combined do not teach or suggest all of the elements of the claimed subject matter.

In the rejection of independent claims 1, 9, and 17, the Final Office Action cited Chadha as teaching a basket database table that contains summary

information about the retail transactional data (Chadha, col. 15, lines 21-29), an item database table that contains information about individual items referenced in the retail transactional data (Chadha, col. 8, lines 53-60), and a department database table that contains aggregate information about the retail transactional data (Chadha, col. 10, lines 48-55). Bruce at page 3, last line to page 4, line 3, and Figure 3, was cited as teaching mapping the data model to aggregate the transactional data for cluster analysis of shopping behavior.

Chadha, col. 15, lines 19-29, is provided below:

> The experiments were conducted on an IBM PowerStation 590, that has a 66 Mhz Power2 processor with 512 MB memory, with a 1.07 GB serial-link disk drive. The mining data was drawn from sales data of a retail store chain, with transactions drawn over various periods of time. The data has an average of 12 items per sale (i.e., the SC data model has about 12 times the number of rows as the MC data model). The UDF implementation for the MC data model supported a maximum of 60 items per transaction, and the input data under both the SC and MC data models were identical.

Column 15, lines 19-29 of Chadha, provided above, describes a test performed utilizing mining data drawn from sales data of a retail store chain, with transactions drawn over various periods of time. It is not seen that this is equivalent to "a basket database table that contains summary information about the retail transactional data" recited in each claim of the present application.

Column 10, lines 48-55 of Chadha recites "One of the columns in the multi-column data store represents a transaction, and each of the remaining columns in the multi-column data store represents elements of that transaction. In Block 202, the Data Mining System 124 performs a combination operator to obtain candidate itemsets of data from the multi-column data store, each itemset being a
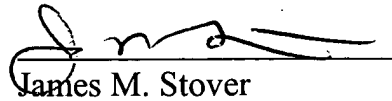
combination of a number of rows of the multi-column data store. It is not seen that this is equivalent to "a department database table that contains aggregate information about the retail transactional data" recited in each claim of the present application.

Bruce at page 3, last line to page 4, line 3, and Figure 3, was cited as teaching mapping the data model to aggregate the transactional data for cluster analysis of shopping behavior. The cited text of Bruce describes data marts and the reformulation of information within a warehouse along lines that will better support specific analysis needs. Figure 3 of Bruce illustrates a system including a source dataset, data mining, and analysis components. It is not seen, however, that the cited text and figure of Bruce describes or illustrates the limitation of a data model mapped "to aggregate the transactional data for cluster analysis of shopping behavior," recited in each claim of the present application.

As none of the cited references teaches "a basket database table that contains summary information about the retail transactional data," "a department database table that contains aggregate information about the retail transactional data," or a data model mapped "to aggregate the transactional data for cluster analysis of shopping behavior", as recited in each one of independent claims 1, 9 and 17, it is believed that claims 1, 9 and 17, as well as dependent claims 6-8, 14-16, and 22-27, are patentable over the cited references, taken singularly or in combination.

In view of the forgoing, it is submitted that the rejection of claims 1, 6-9, 14-17 and 22-27 under 35 U.S.C. § 103(a) is improper and should, therefore, be withdrawn. Review of the present application and claims with consideration of the foregoing comments, and reconsideration of the rejection of claims 1, 6-9, 14-17 and 22-27, are respectfully requested.

Respectfully submitted,

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(VIII) CLAIMS APPENDIX

1. (Previously Presented) A computer-implemented data mining system, comprising:

a relational database managed by a relational database management system for storing retail transactional data;

a data model that defines the manner in which said retail transactional data is stored and organized within said relational database, said data model comprising a basket database table that contains summary information about the retail transactional data, an item database table that contains information about individual items referenced in the retail transactional data, and a department database table that contains aggregate information about the retail transactional data, and the data model is mapped to aggregate the transactional data for cluster analysis of shopping behavior; and

wherein the cluster analysis groups the retail transactional data into coherent groups according to perceived similarities in the retail transactional data and presents the results of said cluster analysis to a user.

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Previously Presented) The computer-implemented data mining system of claim 1, wherein the data model is mapped into a single flat table format to produce a correct level of aggregation for statistical analysis.

7. (Previously Presented) The computer-implemented data mining system of claim 1, wherein the data model is mapped into a database view to produce a correct level of aggregation for statistical analysis.

8. (Previously Presented) The computer-implemented data mining system of claim 1, wherein the data model is comprised of one row per transaction in the retail transactional data.

9. (Previously Presented) A method for analyzing retail transactional data in a computer-implemented data mining system, comprising:

maintaining a relational database managed by a relational database management system for storing retail transactional data

generating a data structure in the computer-implemented data mining system, wherein the data structure is a data model that defines the manner in which said retail transactional data is stored and organized within said relational database, said data model comprising a basket database table that contains summary information about the retail transactional data, an item database table that contains information about individual items referenced in the retail transactional data, and a department database table that contains aggregate information about the retail transactional data;

mapping the data model to aggregate the transactional data for cluster analysis of shopping behavior;

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performing cluster analysis to group said retail transactional data into coherent groups according to perceived similarities in the retail transactional data; and

presenting the results of said cluster analysis to a user.

10. (Cancelled)

11. (Cancelled)

12. (Cancelled)

13. (Cancelled)

14. (Original) The method of claim 9, wherein the mapping step comprises mapping the data model into a single flat table format to produce a correct level of aggregation for statistical analysis.

15. (Original) The method of claim 9, wherein the mapping step comprises mapping the data model into a database view to produce a correct level of aggregation for statistical analysis.

16. (Previously Presented) The method of claim 9, wherein the data model is comprised of one row per transaction in the retail transactional data.

17. (Previously Presented) An apparatus for analyzing retail transactional data in a computer-implemented data mining system, comprising:

a relational database managed by a relational database management system for storing retail transactional data

means for generating a data structure in the computer-implemented data mining system, wherein the data structure is a data model that defines the manner in which said retail transactional data is stored and organized within said relational database, said data model comprising a basket database table that contains summary information about the retail transactional data, an item database table that contains information about individual items referenced in the retail transactional data, and a department database table that contains aggregate information about the retail transactional data; and

means for mapping the data model to aggregate the transactional data for cluster analysis of shopping behavior;

means for performing cluster analysis to group said retail transactional data into coherent groups according to perceived similarities in the retail transactional data; and

means for presenting the results of said cluster analysis to a user.

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Original) The apparatus of claim 17, wherein the means for mapping comprises means for mapping the data model into a single flat table format to produce a correct level of aggregation for statistical analysis.

23. (Original) The apparatus of claim 17, wherein the means for mapping comprises means for mapping the data model into a database view to produce a correct level of aggregation for statistical analysis.

24. (Previously Presented) The apparatus of claim 17, wherein the data model is comprised of one row per transaction in the retail transactional data.

25. (Previously Presented) The computer-implemented data mining system of claim 1, wherein the cluster analysis utilizes a Gaussian Mixture Model.

26. (Previously Presented) The method of claim 9, wherein the cluster analysis utilizes a Gaussian Mixture Model.

27. (Previously Presented) The apparatus of claim 17, wherein the cluster analysis utilizes a Gaussian Mixture Model.

(IX) EVIDENCE APPENDIX

Not applicable

(X) RELATED PROCEEDINGS APPENDIX

Not applicable